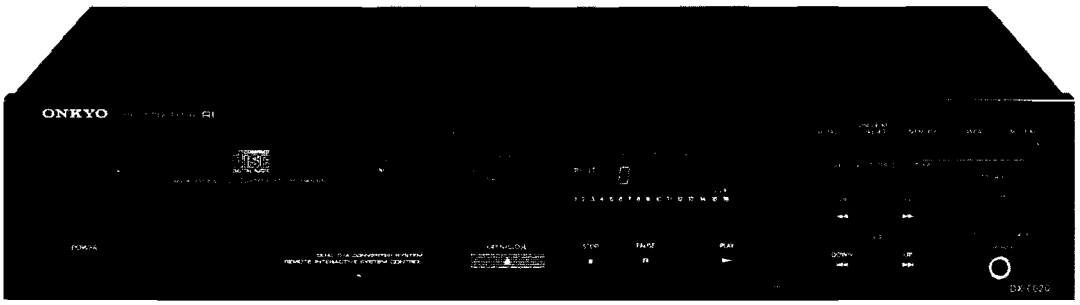
V07004

DX-6620

SERIAL NO. 3314

ONKYO® SERVICE MANUAL

COMPACT DISC PLAYER
MODEL DX-6620



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

Compact disc player

System	Compact disc digital audio system
Laser	Semiconductor laser (λ = 780 nm)
Emission duration	Continuous
Laser output	Max. 0.4 mW This output is the value measured at a distance of about 1.6 mm from the objective lens surface on the Optical Pick-up Block.
Frequency response	2 Hz - 20 kHz (±0.5 dB)
Signal to noise ratio	More than 100 dB
Dynamic range	More than 88 dB
Harmonic distortion	Less than 0.05% (1 kHz)
Wow and flutter	Below measurable limit
Outputs	LINE OUT (phono jacks) Output level 2 V (at 50 kilohms) Load impedance over 10 kilohms
Channel separation	More than 92 dB (1 kHz)

General

Power requirements	220 V AC, 50 Hz
Power consumption	10 W
Dimensions (approx.) (w/h/d)	435x98.5x340 mm (17⅛x 3⅞ x13⅜ inches) including projecting parts and controls
Weight (approx., net)	4.5 kg (9.9 lbs)

TABLE OF CONTENTS

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

1. Laser Diode Properties
   - Material: GaAlAs
   - Wavelength: 780 nm
   - Emission Duration: continuous
   - Laser Output: max. 44.6 μW*

     * This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.

2. During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including laser diode), replace the entire Optical Pick-up Block (including APC board).

BESKYTTELSE AF ØJNE MOD LASERSTRÅLING UNDER SERVICE

I dette apparat anvendes laserlys. Derfor skal nedenstående instruktioner nøje følges under service.

Følg iøvrigt instruktionerne i servicemanualen.

ADVARSEL!!

Under service må øjnene ikke komme nær objektiv-linsen på den optiske pick-up enhed. I tilfælde af at det er nødvendigt at kontrollere udsendelsen af laserlys, skal det ske i en afstand af mere end 25 cm fra den optiske pick-up.

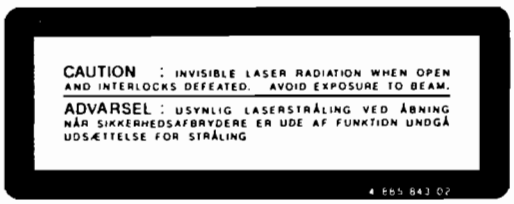
1. Laser-didoe data
   - Materiale: GaAlAs
   - Bølgelængde: 780 nm
   - Udstråling: Kontinuerlig
   - Laseroutput: Max. 0.4 mW*
     * Målt i 1,6 mm afstand fra overfladen af objektiv-linsen på den optiske pick-up enhed.
   - Klassifikation: Klasse IIIb.

2. Adskil aldrig den optiske pick-up enhed under service, og juster ikke APC kredsløbet (Automatic Power Control). Hvis APC kredsløbet (incl. laser-dioden) bryder ned, skal hele den optiske pick-up enhed (incl. APC printkortet) udskiftes.

LASER ADVARSEL MÆRKNING

Følgende mærkning findes indvendig i apparatet:

1. Advarsel Mærkning

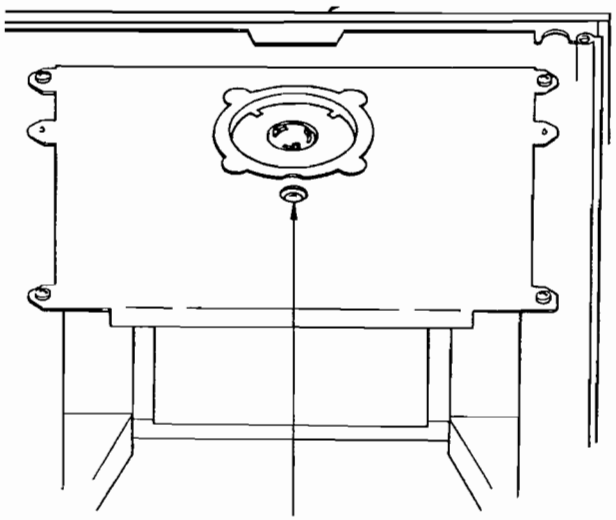


VAROITUS: Laite sisältää, laserdiodin, joka lähettää (näkymätöntä) silmille vaarallista lasersateilyä.

SERVICING NOTE

LASER DIODE AND FOCUS SEARCH OPERATION CHECK

1. Make POWER switch on with no disc inserted and disc table closed.
2. Confirm that the operation indicated in Fig. C is performed while observing the objecting lens.



① *Confirm that laser beam is spread.*
② *Up and down motion of the objective lens. (3 times)*

Fig. C

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe more than 25 cm away from the objective lens.

CIRCUIT DESCRIPTIONS

IC101 (MSC6458-23SS) SYSTEM CONTROL MICROCOMPUTER

Table 1 Pin Functions IC101

Description of IC101 (MSC6458)

IC101 has the following functions:

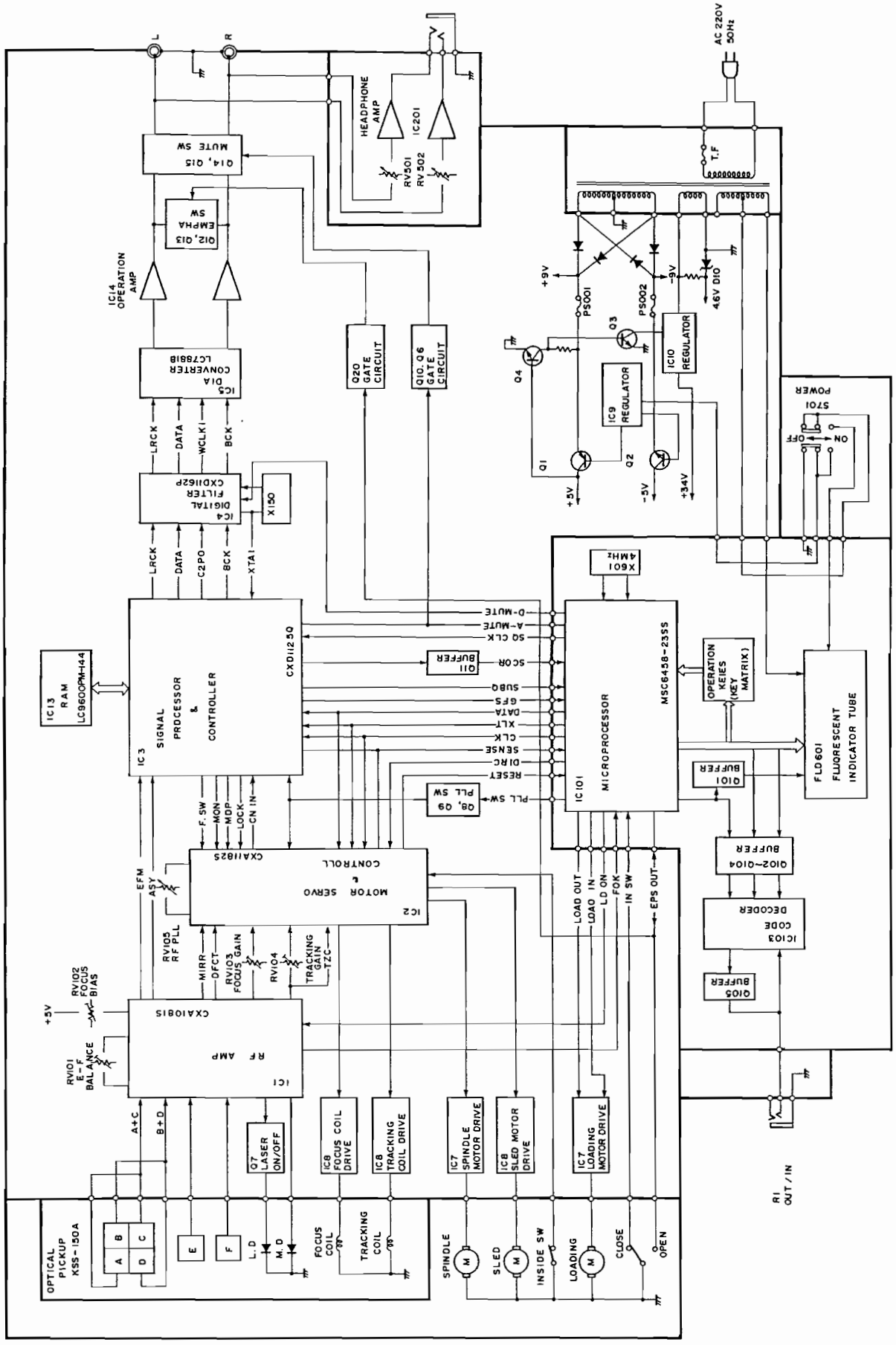
- Digital signal output to operation key
- Sub Q signal loading and processing
- Fluorescent display (FLD) control
- Servo circuit control

Pin Function

Pin No.	Pin name	I/O	Description
1	DIRC	O	Jump pulse inversion instruction during 1 track jump.
2	CLK	O	Command transfer of clock to SSP (IC2) and DSP (IC3).
3	DATA	O	Command transfer of data to SSP (IC2) and DSP (IC3).
4	XLT	O	Command transfer of latch to SSP (IC2) and DSP (IC3).
5	M-SYNC	O	Sync REC ("H" for 300msec during muting).
6	P-SYNC	O	Sync REC ("H" for 300msec when muting is off).
7	SENSE	I	SSP (IC2) and DSP (IC3) sense information.
8	SYNC ON	I	Sync REC ("L" in REC mode).
9	SIRCS	I	Remote control signal input.
10	$\overline{\text{SCOR}}$	I	Q code read timing.
11	VL UP	O	Remote controller. "L" when volume is being increased.
12	ADJ	I	"L" in PLAY mode.
13	AMUTE	O	All muting. Output to DSP (IC3) MUTG.
14	DMUTE	O	Software muting. Output to digital filter (IC4) software.
15	SUBQ	I	Subcode data.
16	SQCLK	O	Subcode data read clock.
17	GFS	I	"H" when CLV is locked.
18	FOK	I	"H" when focus is on.
19	KEY0	I	Key matrix input, "H" active.
20	KEY1	I	Key matric input, "H" active.
21	KEY2	I	Key matrix input, "H" active.
22	KEY3	I	Key matrix input, "H" active.
23	KEY4	I	Key matrix input, "H" active.
24	KEY5	I	Key matrix input, "H" active.
25	$\overline{\text{INSW}}$	I	Loading IN SW.
26	$\overline{\text{LDON}}$	O	Laser on/off.
27	EPS/$\overline{\text{OUTSW}}$	I/O	Emphasis on/off (during loading). Loading OUT SW.
28	LODOUT	O	Loading motor control.

Pin No.	Pin name	I/O	Description
29	LODIN	O	Loading motor control.
30	OSC1	I	Oscillator input terminal (4 MHz).
31	OSC0	I	Oscillator input terminal (4 MHz).
32	GND	-	GND terminal.
33	RESET	I	Reset input terminal. Input when power is turned on.
34	TEST	-	No connection (NC).
35	VL DOWN	-	No connection (NC).
36	TIMER	-	No connection (NC).
37	AFADJ	I	"L" in PLAY mode. CLV-S is fixed. "L" in test mode before power is turned on.
38	PLLSW	O	"L" in PLAY mode and "H" in search mode.
39	8G	O	FLD timing output.
40	7G	O	FLD timing output.
41	6G	O	FLD timing output.
42	5G	O	FLD timing output.
43	4G	O	FLD timing output.
44	3G	O	FLD timing input.
45	2G	O	FLD timing input.
46	1G	O	FLD timing input.
47	NC	-	No connection (NC).
48	o	O	FLD segment output.
49	n	O	FLD segment output.
50	m	O	FLD segment output.
51	+30V	-	+30V
52	l	O	FLD segment output.
53	k	O	FLD segment output.
54	j	O	FLD segment output.
55	i	O	FLD segment output.
56	h	O	FLD segment output.
57	g	O	FLD segment output.
58	f	O	FLD segment output.
59	e	O	FLD segment output.
60	d	O	FLD segment output.
61	c	O	FLD segment output.
62	b	O	FLD segment output.
63	a	O	FLD segment output.
64	VDD	-	Positive (+) power supply (5V)

BLOCK DIAGRAM



ADJUSTMENT PROCEDURES

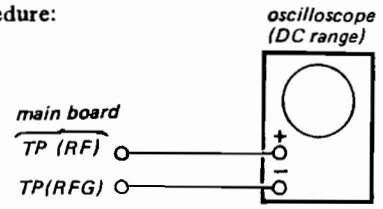
ELECTRICAL ADJUSTMENTS

1. Perform adjustments in the order given.
2. Use YEDS-18 (Part No. 0R016) disc unless otherwise indicated.
3. Use the oscilloscope with more than 10 MΩ impedance.

Focus Bias Adjustment

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

Procedure:

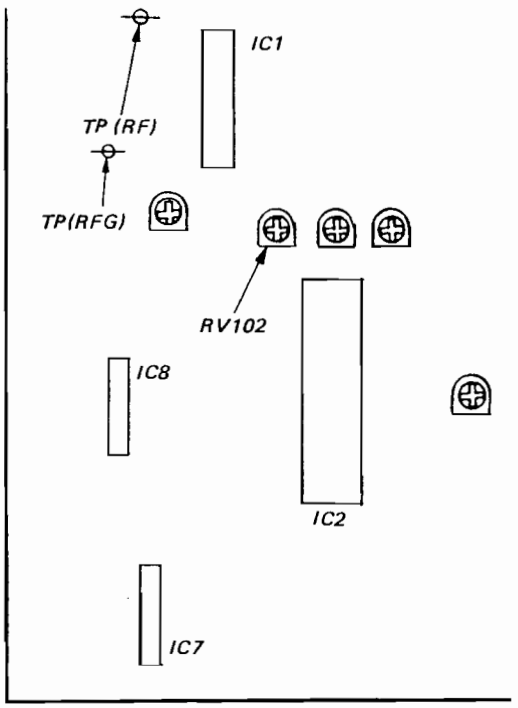


1. Connect oscilloscope to test points TP (RF).
2. Turn POWER switch on.
3. Put disc (YEDS-18) in and press ▷ button.
4. Adjust RV102 for an optimum waveform eye pattern or so that the peak is maximum. Optimum eye pattern means that shape " ◇ " can be clearly distinguished at the center of the waveform.

RF signal waveform

A = 1.2V ± 0.2 (Vp-p)

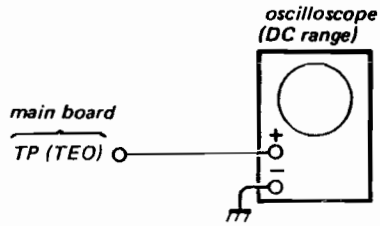
Adjustment Location: main board



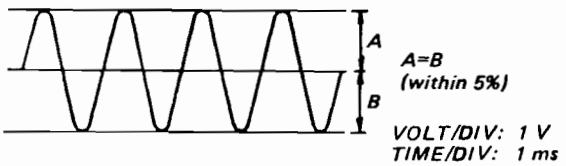
E-F Balance Adjustment

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

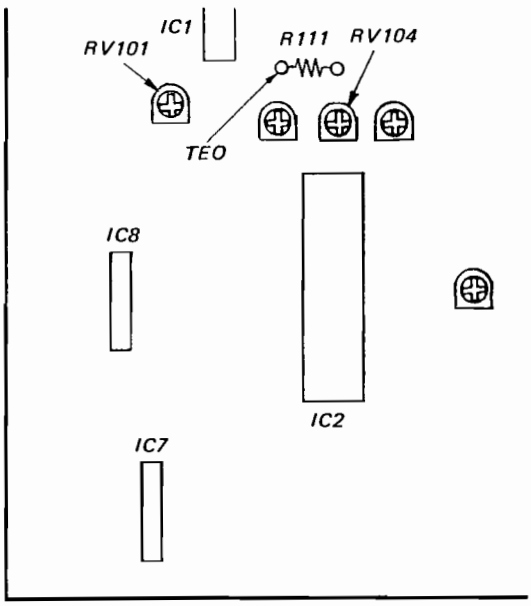
Procedure:



1. Turn RV104 fully counterclockwise (minimum).
2. Connect oscilloscope to test point TP (TEO).
3. Turn POWER switch on.
4. Put disc (YEDS-18) in and press ▷ button.
5. Adjust RV101 so that the traverse waveform is symmetrical above and below.

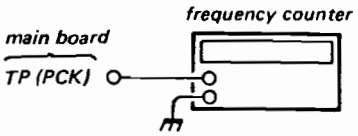


Adjustment Location: main board



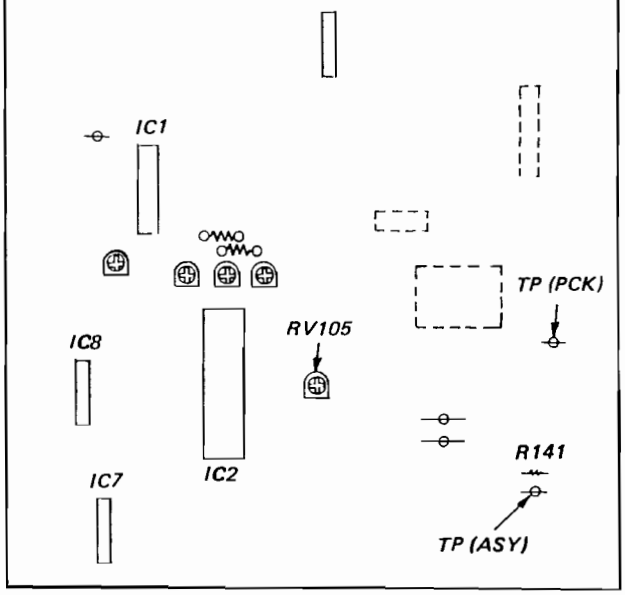
RF PLL Frequency Adjustment/Lock Frequency Check

Procedure:



1. Connect test point TP (ASY) to ground with lead wire.
2. Turn POWER switch on.
3. Connect the frequency counter to test points TP (PCK).
4. Adjust RV105 so that the reading on frequency counter is 4.3218 MHz ± 30 kHz.
   . . . . . (RF PLL frequency adjustment)
5. Remove lead wire connecting TP (ASY) to ground.
6. Put disc (YEDS-18) in and press ▷ button.
7. Confirm that the reading on frequency counter is 4.3218 MHz.
8. After adjustment, remove the lead wire connected in step 5.

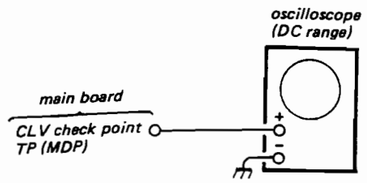
Adjustment Location: main board



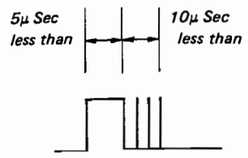
REFERENCE

CLV Phase Lock Check

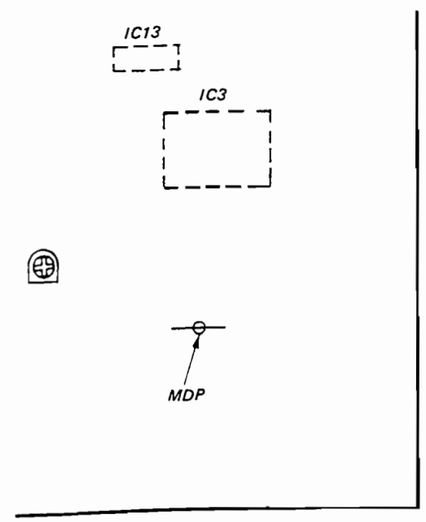
Procedure:



1. Connect oscilloscope to test point TP (MDP).
2. Turn POWER switch on.
3. Put disc (YEDS-18; TRACK No. 5) in and press ▷ button.
4. Check that the waveform is as shown in the figure below.



Adjustment Location: main board



Focus/Tracking Gain Adjustment

A frequency response analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pick-up follow-up (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, it is more susceptible to mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

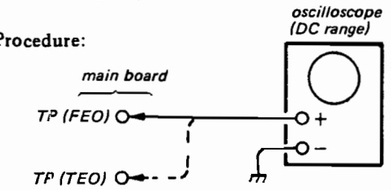
Symptoms \ Gain	Focus	Tracking
• The time until music starts becomes longer for STOP →▷PLAY or automatic selection (⏮ ⏭ buttons pressed. (Normally takes about 2 seconds.)	low	low or high
• Music does not start and disc continues to rotate for STOP→▷PLAY or automatic selection (⏮ ⏭ buttons pressed.)	–	low
• Disc table opens shortly after STOP→▷PLAY.	low or high	–
• Sound is interrupted during PLAY. Or time counter display stops progressing.	–	low
• More poise during 2-axis device operation.	high	high

The following is a simple adjustment method.

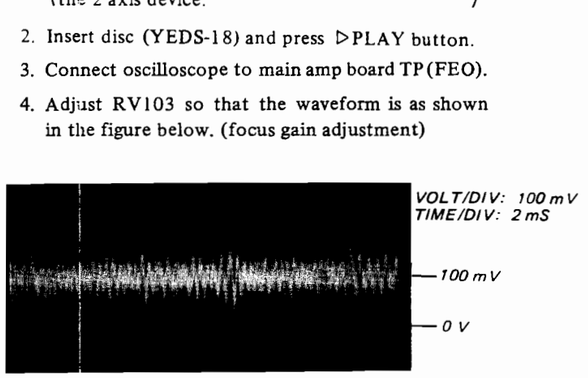
– Simple Adjustment –

Note: Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment. If the positions after the simple adjustment are only a little different, return the controls to the original position.

Procedure:

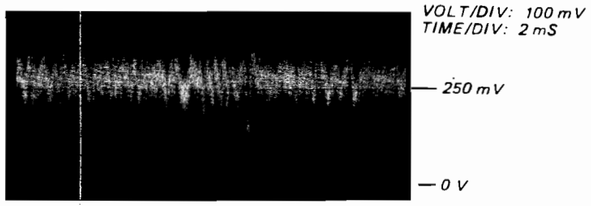


1. Keep the set horizontal.
   (If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2 axis device.)
2. Insert disc (YEDS-18) and press ▷PLAY button.
3. Connect oscilloscope to main amp board TP (FEO).
4. Adjust RV103 so that the waveform is as shown in the figure below. (focus gain adjustment)

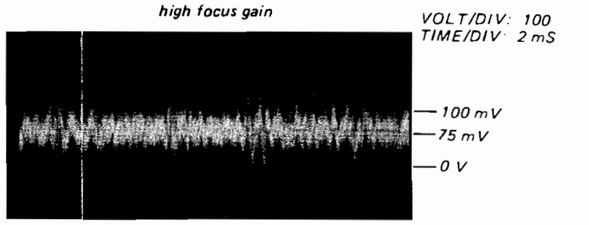


- Incorrent Examples (DC level changes more than on adjusted waveform)

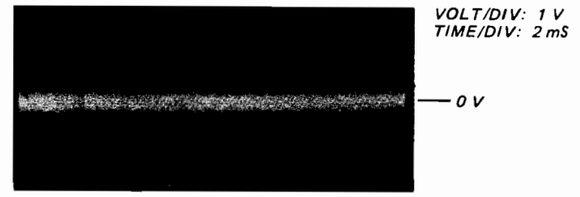
low focus gain



high focus gain



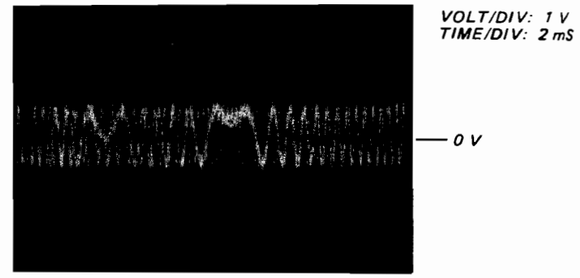
5. Connect oscilloscope to main board TP (TEO).
6. Adjust RV104 so that the waveform is as shown in the figure below. (tracking gain adjustment)



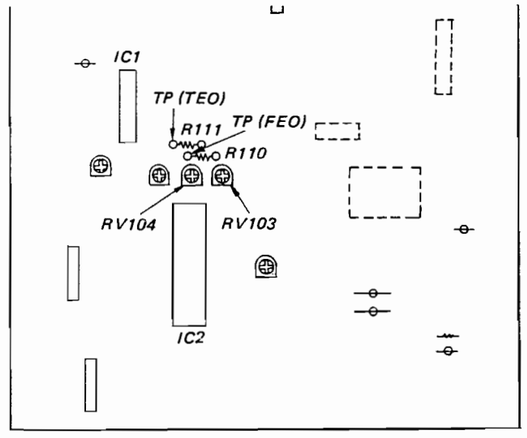
- Incorrect Examples (fundamental wave appears)

low tracking gain

high tracking gain
(higher fundamental wave than for low gain)

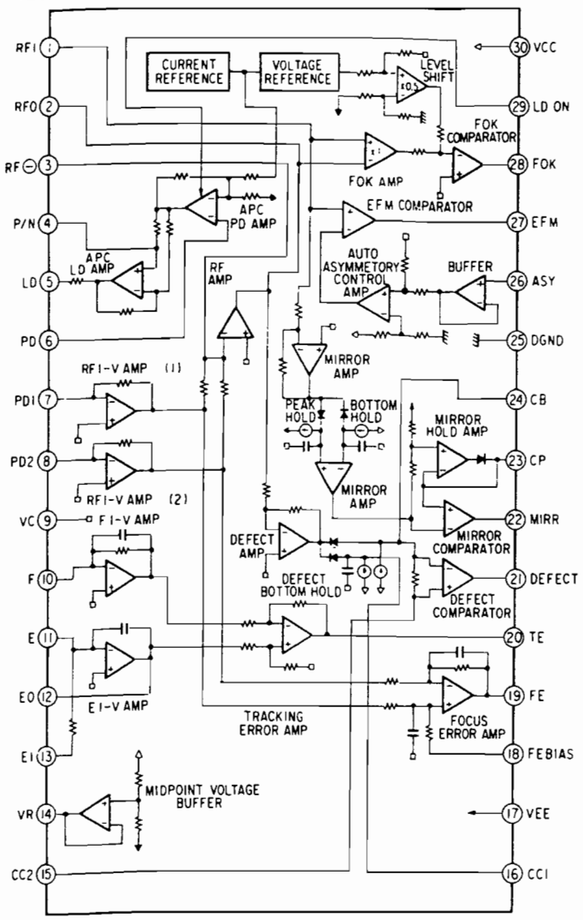


Adjustment Location: main board

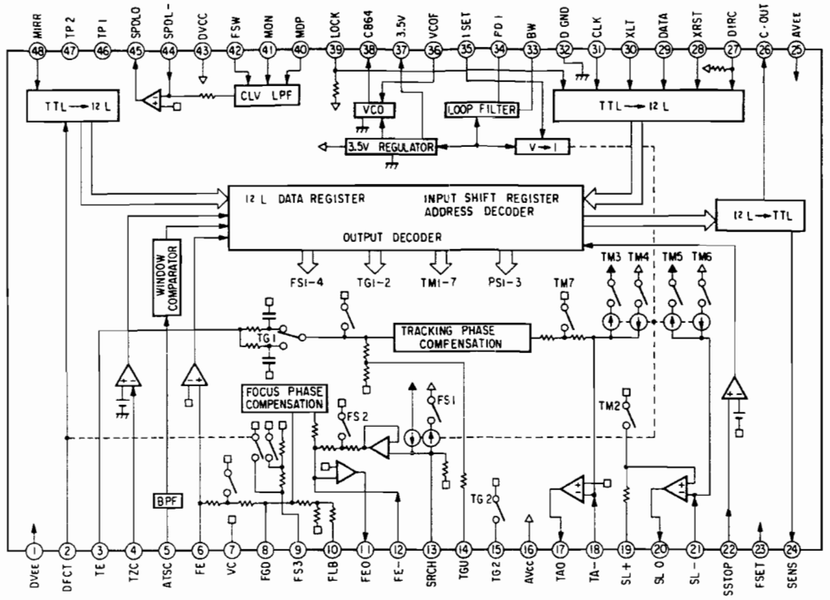


IC BLOCK DIAGRAM

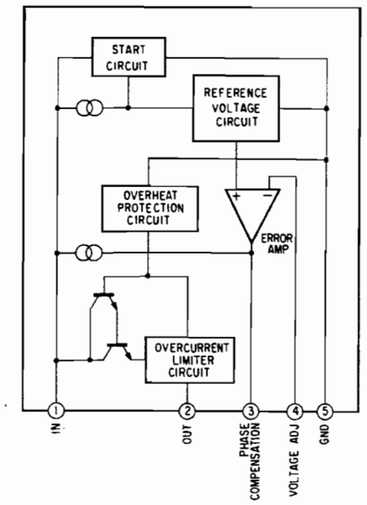
IC1 CXA1081S



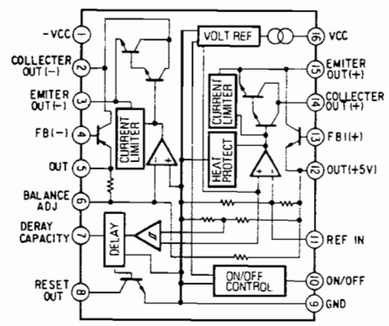
IC2 CXA1182S



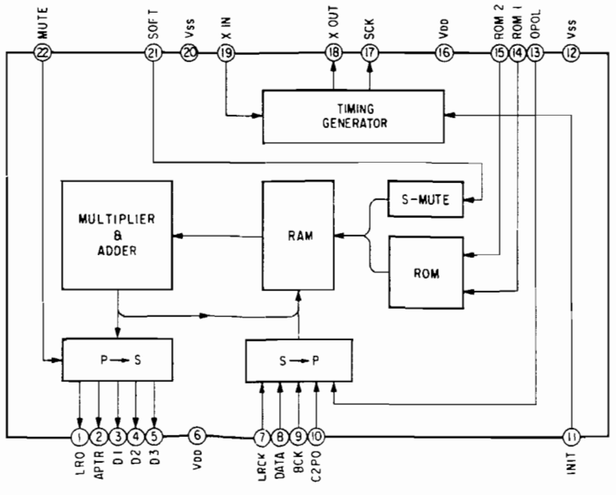
IC10 M5231TL



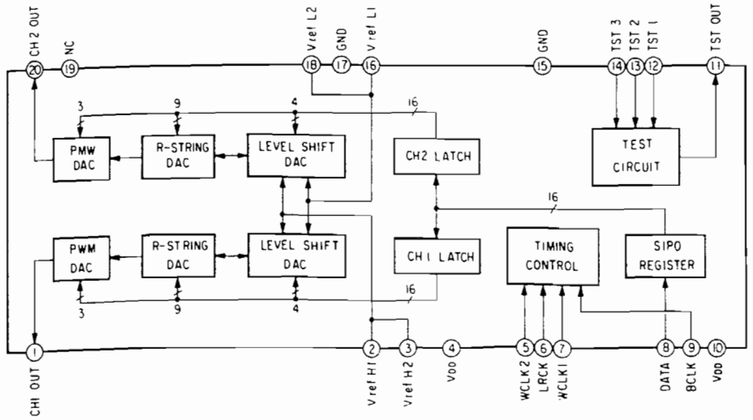
IC9 M5290-16



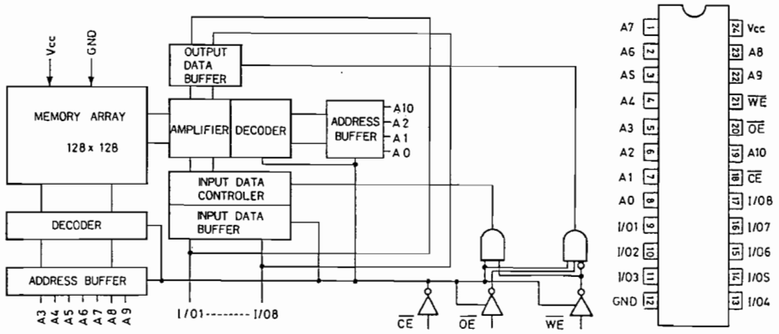
IC4 CXD1162P



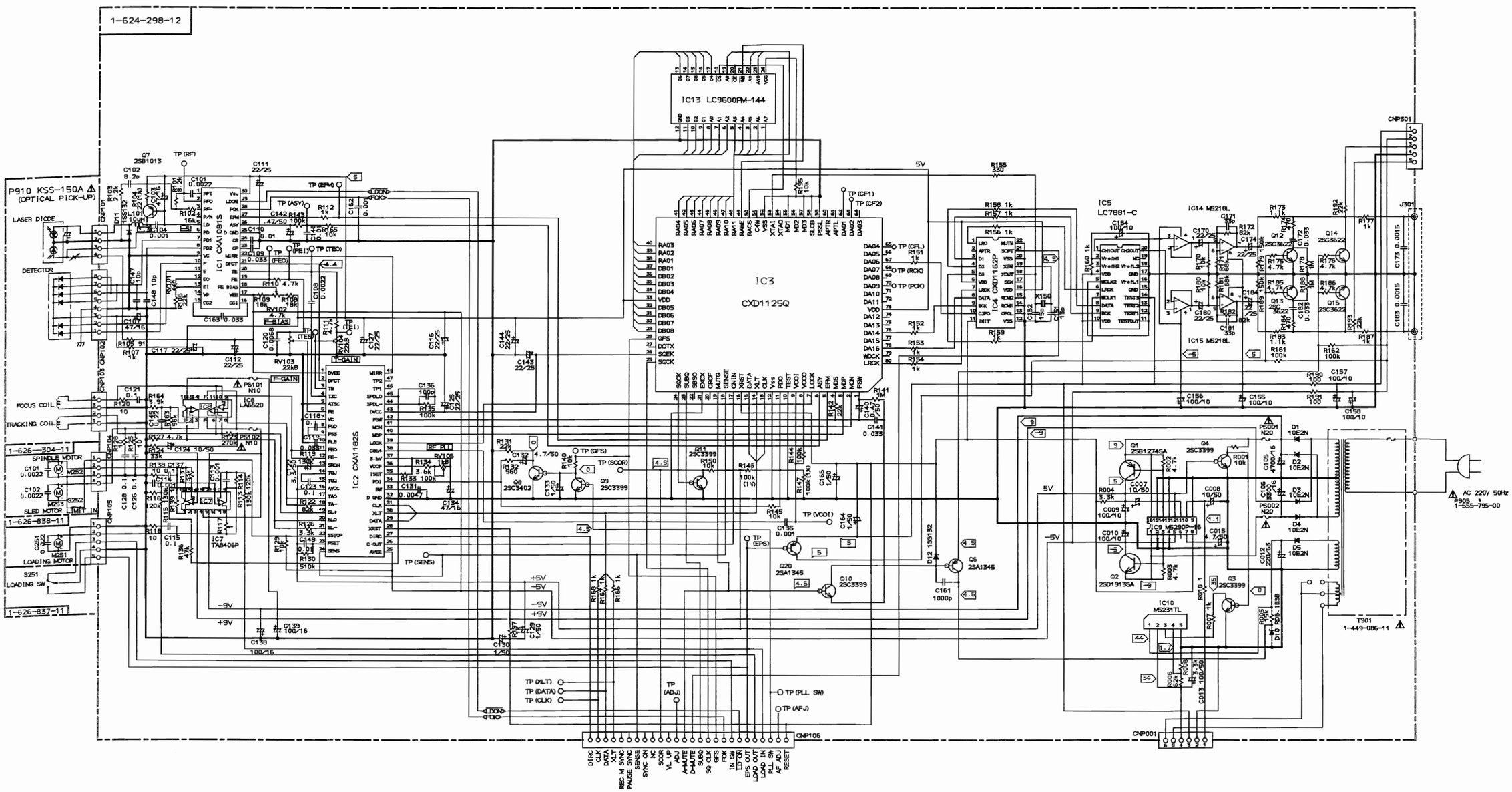
IC5 LC-7881-B



IC13 LC9600PM-144



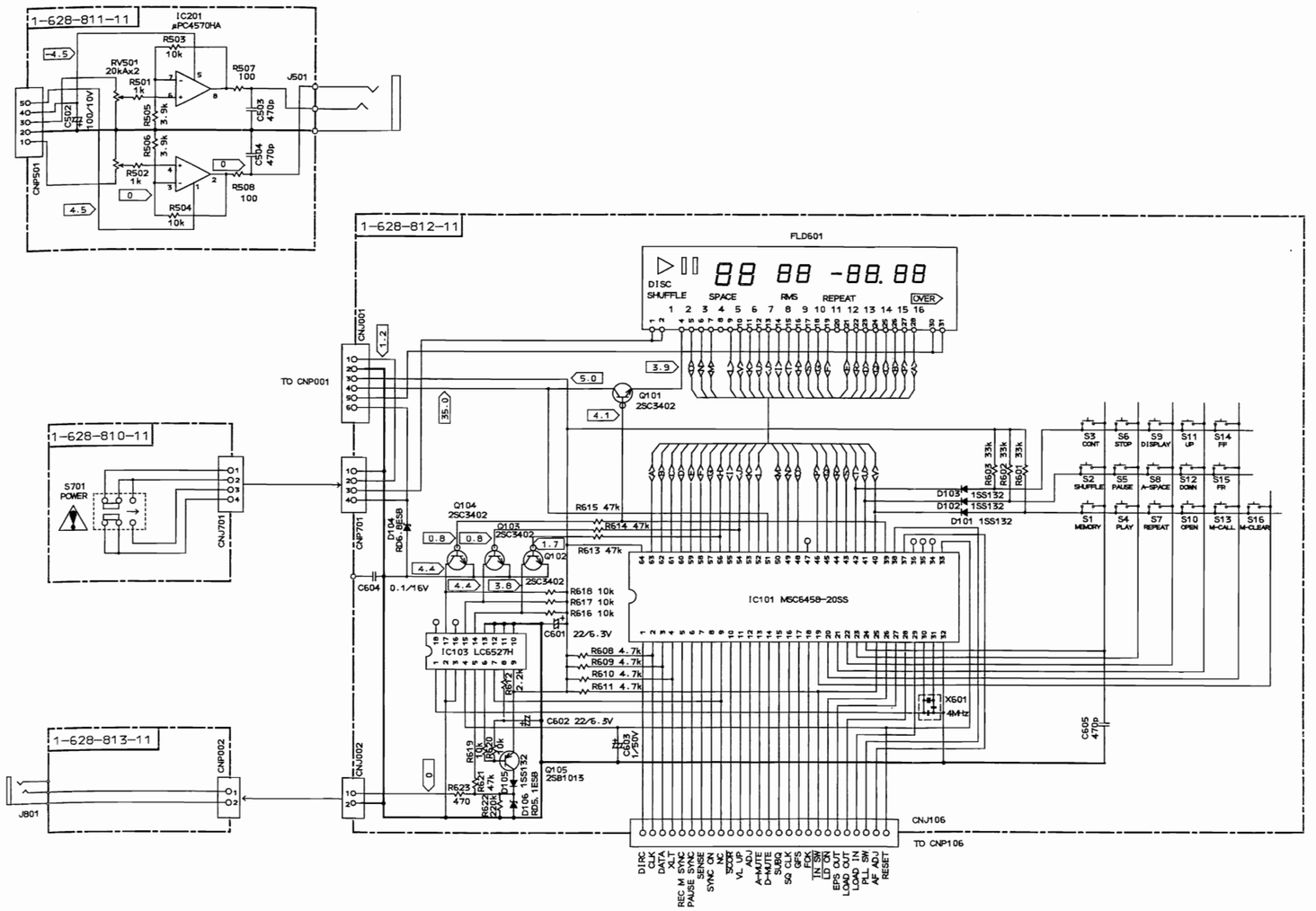
SCHEMATIC DIAGRAM



NOTES
- ALL RESISTORS ARE IN OHMS, 1/4WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN µF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (*@#) ARE IN µF/WV.
- VOLTAGE (MEASURED WITH VTVM) (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT
  THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY.
  REPLACE ONLY WITH PART NUMBER SPECIFIED.

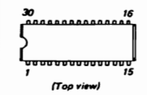
C	D	G	J	K	M	Z
±0.25PF	±0.5PF	± 2%	± 5%	± 10%	± 20%	+ 80 % - 20 %

ONKYO CORPORATION

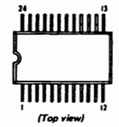


SEMICONDUCTOR LEAD LAYOUT

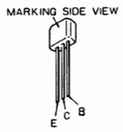
CXA1081S



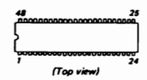
LC9600P-144



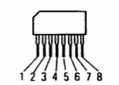
2SA1345



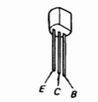
CXA1182S



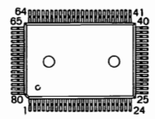
M5218L



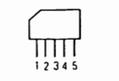
2SB1013
2SC3622A-K



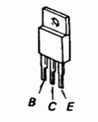
CXD1125Q



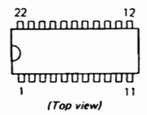
M5231TL



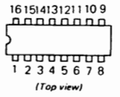
2SB1133SA
2SD1666SA



CXD1162P



M5290P-16
TA8406P



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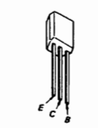
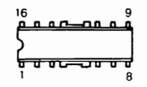
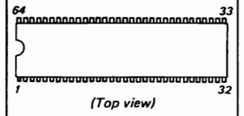
2SC3402



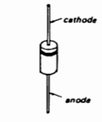
LA6520



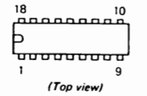
MSC6458-23SS



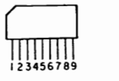
ISS132
10E2N



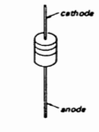
LC6527-H



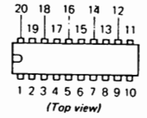
μPC4570HA



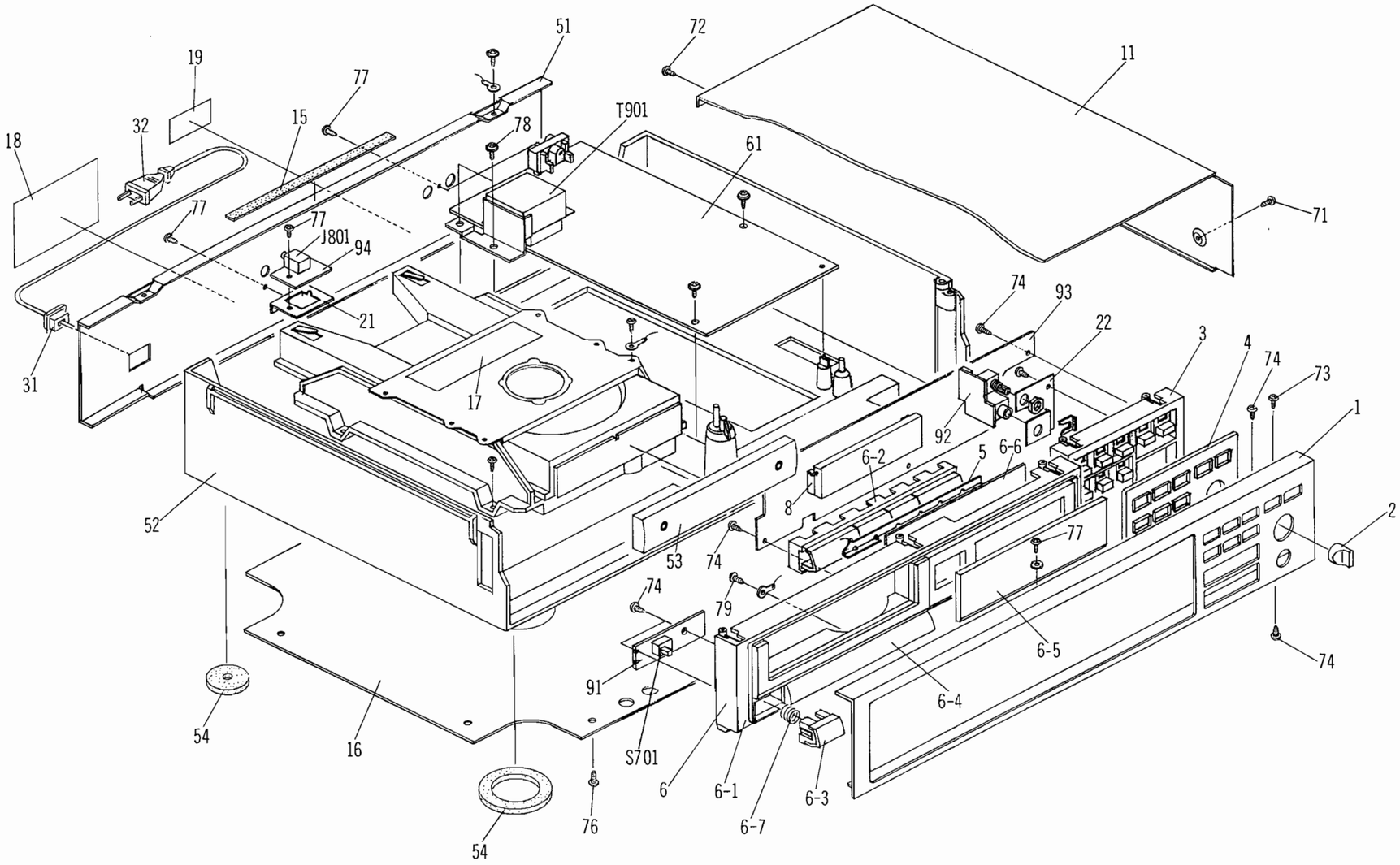
RD5.1ES-B2
RD6.8ES-B2



LC-7881-B



EXPLODED VIEW



NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

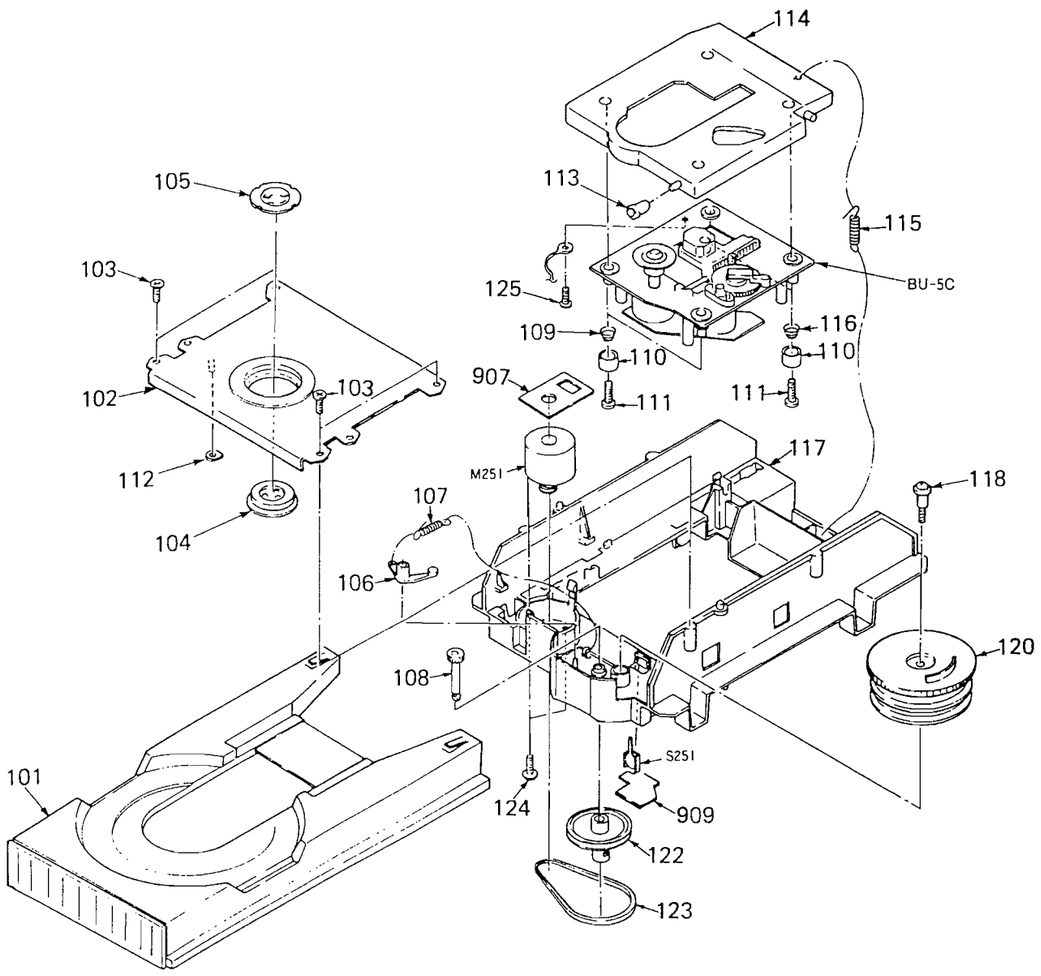
PARTS LIST

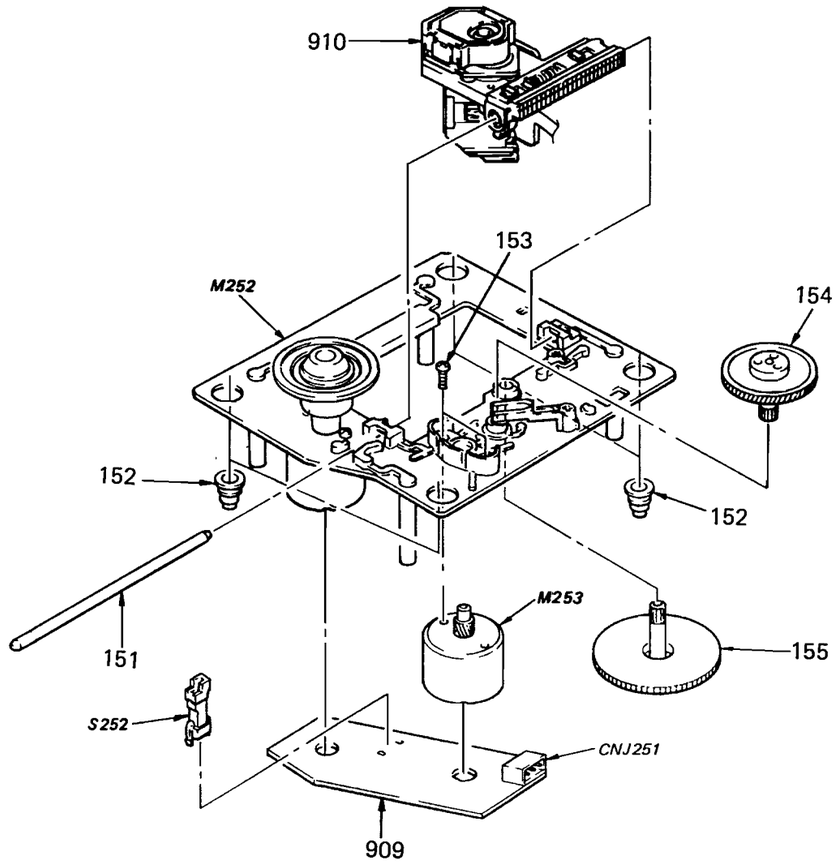
REF.NO.	PART NO.	DESCRIPTION
1	4-922-464-11	PANEL, FRONT ⟨B⟩
	4-922-464-21	PANEL, FRONT ⟨S⟩
2	4-922-445-01	KNOB (PH) ⟨B⟩
	4-922-445-11	KNOB (PH) ⟨S⟩
3	4-922-442-01	BUTTON (R) ⟨B⟩
	4-922-442-11	BUTTON (R) ⟨S⟩
4	4-922-441-01	GUIDE (R) ⟨B⟩
	4-922-441-11	GUIDE (R) ⟨S⟩
5	4-922-448-01	PLATE, GROUND
6	X-4922-421-1	HOLDER (L) ASSY ⟨B⟩
	X-4922-426-1	HOLDER (L) ASSY ⟨S⟩
6-1	4-922-438-01	HOLDER (L) ⟨B⟩
	4-922-438-11	HOLDER (L) ⟨S⟩
6-2	X-4922-422-1	BUTTON (L) ASSY ⟨B⟩
	X-4922-427-1	BUTTON (L) ASSY ⟨S⟩
6-3	X-4922-423-1	BUTTON (POW) ASSY ⟨B⟩
	X-4922-428-1	BUTTON (POW) ASSY ⟨S⟩
6-4	4-922-457-01	BUTTON, DECORATION ⟨B⟩
	4-922-457-11	BUTTON, DECORATION ⟨S⟩
6-5	4-922-456-01	PLATE, CLEAR
6-6	4-922-458-01	PLATE, BACK
6-7	4-922-449-01	SPRING, TENSION
8	9-911-842-XX	CUSHION (S)
11	4-922-463-01	COVER ⟨B⟩
	4-922-463-11	COVER ⟨S⟩
15	4-922-422-01	CUSHION C
16	4-922-927-41	PLATE, BOTTOM
17	4-885-843-02	LABEL, CAUTION, LASER
18	4-922-450-01	LABEL, MODEL NUMBER
21	4-922-453-01	SETTING PLATE (RI)
22	4-922-452-01	SETTING PLATE (PH)
31	3-703-244-00	⚠BUSHING(2104), CORD
32	1-574-127-11	⚠CORD, POWER
51	4-922-403-81	PANEL, BACK
52	4-922-928-01	CHASSIS
53	4-922-440-11	PANEL (B), LOADING ⟨B⟩
	4-922-451-01	PANEL (S), LOADING ⟨S⟩
54	4-922-942-01	FOOT, FELT
61	A-4651-215-A	MOUNTED PCB, MAIN
71	7-685-646-79	SCREW, TAPPING
72	7-682-547-09	SCREW, +BV3×6, S TIGHT
73	7-685-647-79	SCREW, +BVTP3×10, TYPE2 N-S
74	7-685-134-19	SCREW, +BTP 2.6×8, TYPE2 N-S
76	7-682-147-01	SCREW, +BVTT3×6(S)
77	7-685-545-11	SCREW, +BTP 3×6(S), TYPE2, N-S
78	7-685-546-11	SCREW,+BTP 3×8(S), TYPE2, N-S
79	7-685-535-11	SCREW,+BTP 2.6×10, TYPE2 N-S
91	1-628-810-11	PC BOARD, POWER SWITCH
92	1-628-811-11	PC BOARD, HEADPHONE
93	1-628-812-11	PC BOARD, DISPLAY
94	1-628-813-11	PC BOARD, SYNCRO.
T901	1-449-025-11	⚠TRANSFORMER, POWER
S701	1-571-305-11	⚠SWITCH, PUSH (1 KEY)
J801	1-568-150-11	JACK, SMALL

NOTE: ⟨B⟩: Only Black Model
⟨S⟩: Only Silver Model

MECHANISM-EXPLODED VIEW

BU-5C



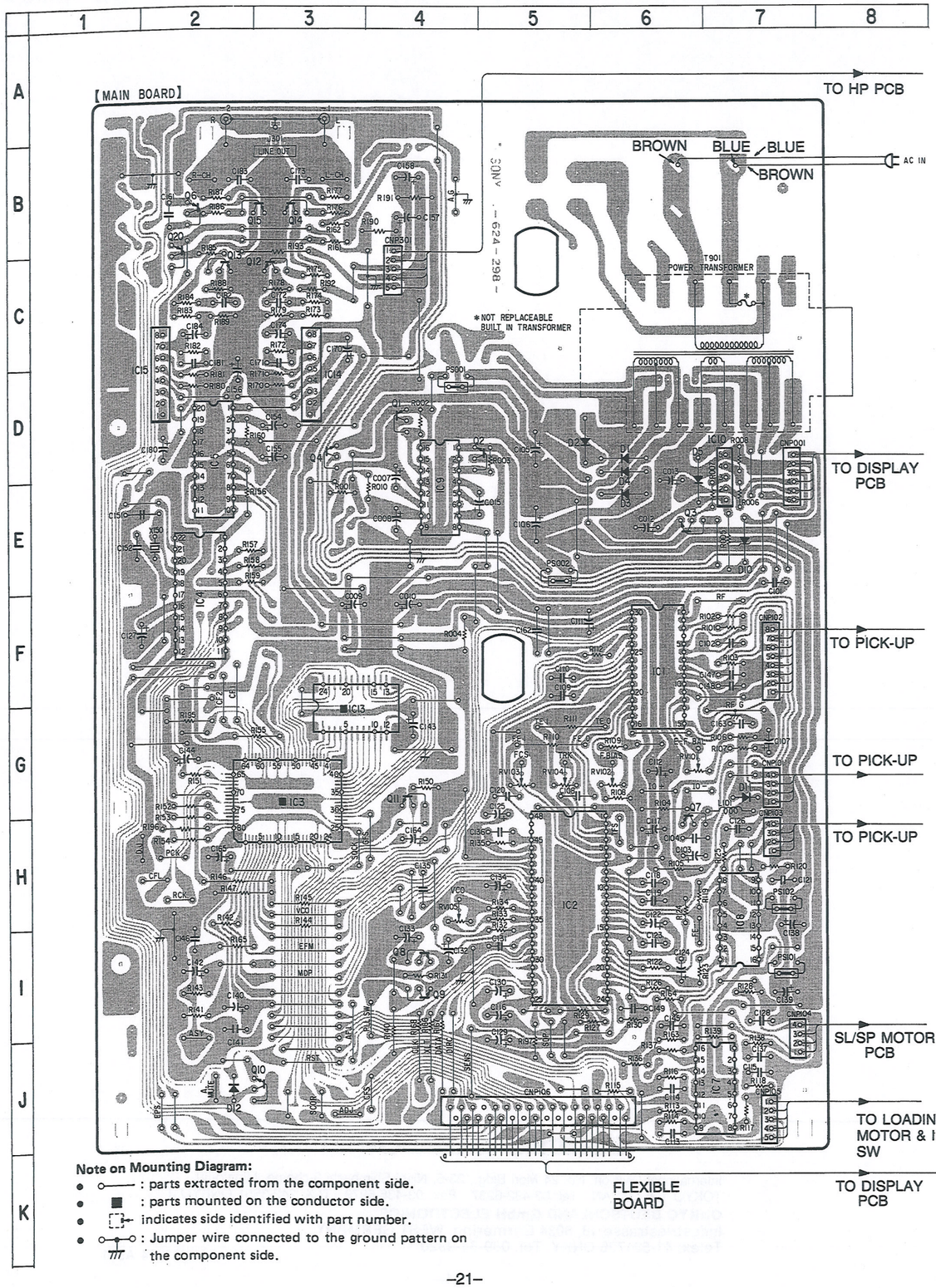


REF.NO.	PART NO.	DESCRIPTION
101	4-925-307-01	TABLE, DISC
102	4-922-510-01	REINFORCEMENT
103	7-685-546-11	SCREW, TAPPING +BTP 3×8 TYPE2 N-S
104	A-4665-024-A	MAGNET ASSY
105	4-918-679-04	PULLEY, PRESS
106	4-917-519-01	LEVER, SET
107	4-917-514-01	SPRING, TENSION
108	4-922-508-01	GEAR(DRIVING)
109	4-917-541-01	SPRING (B)
110	4-917-508-01	HOLDER, SP
111	7-685-535-11	SCREW +BTP 2.6×10 TYPE2 N-S
112	4-922-529-01	DAMPER
113	4-917-515-01	ROLLER
114	4-922-514-01	BRACKET (BU-5)
115	4-917-526-01	SPRING, TENSION
116	4-917-507-01	SPRING (H)
117	4-922-516-01	CHASSIS (MD)
118	7-685-152-19	SCREW, STEP
120	4-925-306-01	GEAR, LOADING
122	4-922-512-01	PULLEY
123	4-917-522-02	BELT
124	7-621-759-40	SCREW +P SW, 2.6×6
125	7-621-770-67	SCREW +BVTT 2.6×6(S)
907	1-626-838-11	PC BOARD, LOADING MOTOR
909	1-626-837-11	PC BOARD, IN/OUT SWITCH
M251	A-4608-346-A	MOTOR ASSY, LOADING
S251	1-571-300-11	SWITCH, ROTARY (IN/OUT SW)

REF.NO.	PART NO.	DESCRIPTION
151	4-917-565-01	SHAFT, SLED
152	4-917-562-01	INSULATOR
153	7-621-255-15	SCREW +P 2×3
154	4-917-567-01	GEAR(M)
155	4-917-564-01	GEAR (P), FLATNESS
909	1-620-097-11	PC BOARD, SL/SP MOTOR
910	8-848-062-01	⚠ PICK-UP, OPTICAL KSS-150A (RP)
CNJ251	1-564-720-11	PIN, CONNECTOR (SMALL TYPE) 4P
M252	X-4917-523-1	BASE ASSY(including SPINDLE MOTOR)
M253	X-4917-504-1	MOTOR ASSY (SLED)
S252	1-570-822-11	SWITCH, LEAF (LIMIT IN)

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



Note on Mounting Diagram:

- ○——: parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- indicates side identified with part number.
- ○—○: Jumper wire connected to the ground pattern on the component side.

PRINTED CIRCUIT BOARD – PARTS LIST

NOTE:

- Due to standardization, replacements (marked "#") in the parts list may be different from the parts specified in the diagrams or the components used on the set.

RESISTORS

- All resistors are in ohms.
- F: nonflammable

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q1	8-729-808-72	2SB1274SA
Q2	8-729-808-76	2SD1913SA
Q3, Q4	# 8-729-900-89	DTC144ES
Q6	# 8-729-900-61	DTA144ES
Q7	8-729-801-83	2SB1013
Q8	# 8-729-900-80	DTC114ES
Q9-Q11	# 8-729-900-89	DTC144ES
Q12-Q15	8-729-107-99	2SC3622A-K
Q20	# 8-729-900-61	DTA114ES
Q101-Q104	8-729-900-80	DTC114ES
Q105	8-729-801-83	2SB1013
	ICs	
IC1	8-752-031-80	CXA1081S
IC2	8-752-032-33	CXA1182S
IC3	8-759-947-02	CXD1125Q
IC4	8-759-946-62	CXD1162P
IC5	8-759-821-23	LC7881-B
IC7	8-759-208-96	TA8406P
IC8	8-759-805-18	LA6520
IC9	8-759-630-21	M5290P-16
IC10	8-759-605-43	M5231TL
IC13	# 8-752-323-64	CXK5816M-12L
IC14, IC15	8-759-600-02	M5218L
IC101	8-759-972-48	MSC6458-23SS
IC103	8-759-821-37	LC6527H-3878
IC201	8-759-112-93	μPC4570HA-1
	Diodes	
D1-D5	8-719-950-59	MPG06D-6052PKG3
D10	8-719-109-85	RD5.1ES-B2
D11, D12	8-719-940-76	1SS132
D101-D103	8-719-940-76	1SS132
D104	8-719-109-97	RD6.8ES-B2
D105	8-719-940-76	1SS132
D106	8-719-109-85	RD5.1ES-B2
	Transformer, power	
T901	⚠ 1-449-025-11	
	Semi-fixed resistors	
RV101	1-228-995-00	22K, Carbon
RV102	1-228-993-00	4.7K, Carbon
RV103, RV104	1-228-995-00	22K, Carbon
RV105	1-237-953-11	1K, Metal glaze
	Variable resistor	
RV501	1-237-789-11	20K/20K, Carbon
	IC links	
PS001, PS002	⚠ 1-532-685-00	
PS101, PS102	⚠ 1-532-605-00	
	Fluorescent indicator tube	
FLD601	1-519-433-11	
	Connector pins	
CN256	1-564-495-11	2P
CN260	1-564-718-11	2P (Small type)
CNP001	1-564-340-00	6P
CNP101	1-564-706-31	4P (Small type)
CNP102	1-564-710-11	8P (Small type)
CNP103	1-564-706-31	4P (Small type)
CNP104	1-564-706-11	4P (Small type)
CNP105	1-564-339-61	5P
CNP301	1-564-707-11	5P (Small type)
CNP501	1-564-721-11	5P (Small type)
CNP601	1-564-497-11	4P

CIRCUIT NO.	PART NO.	DESCRIPTION			
	Socket				
CNP106	1-566-908-11	Connector 32P			
	Film jumper				
CNJ106	1-535-684-11	With terminal			
	Jacks				
J301	1-566-921-11	Pin 2P			
J501	1-568-151-11	Large type			
J801	1-568-150-11	Small			
	Inductor				
L101	1-408-563-21	10μH			
	Switches				
S1-S16	1-554-303-21	Key board			
S251	1-571-300-11	Rotary			
S252	1-570-822-11	Leaf (Limit in)			
S701	⚠ 1-571-305-11	Power			
	Oscillators				
X150	1-567-926-11	Crystal			
X601	1-567-686-11	Ceramic			
	Capacitors				
C007, C008	1-123-875-11	Elect.	10μF	20%	50V
C009, C010	1-124-443-00	Elect.	100μF	20%	10V
C012	1-124-919-11	Elect.	220μF	20%	63V
C013	1-124-122-11	Elect.	100μF	20%	50V
C015	1-124-927-11	Elect.	4.7μF	20%	50V
C101, C102	1-106-351-00	Mylar	2200pF	5%	50V
		(Slide/Spindle motor pc board)			
C101	1-106-351-00	Mylar	2200pF	5%	50V
C102	1-162-198-31	Ceramic	8.2pF	10%	50V
C103, C107	1-124-477-11	Elect.	47μF	20%	16V
C104	1-162-294-31	Ceramic	1000pF	10%	50V
C105	1-124-898-11	Elect.	4700μF	20%	16V
C106	1-124-887-00	Elect.	3300μF	20%	16V
C108	1-161-375-00	Ceramic	2200pF	30%	16V
C109	1-130-489-00	Mylar	0.033μF	5%	50V
C110	1-130-483-00	Mylar	0.01μF	5%	50V
C111, C112	1-126-233-11	Elect.	22μF	20%	25V
C113, C114	1-162-294-31	Ceramic	0.001μF	10%	50V
C115	1-162-851-11	Ceramic	0.1μF	20%	16V
C116, C117	1-126-233-11	Elect.	22μF	20%	25V
C118	1-130-768-00	Film	0.1μF	5%	63V
C119	1-130-489-00	Mylar	0.033μF	5%	50V
C120	1-161-329-00	Ceramic	0.0068μF	20%	16V
C121	1-162-851-11	Ceramic	0.1μF	20%	16V
C122	1-123-382-00	Elect.	3.3μF	20%	50V
C123	1-130-768-00	Film	0.1μF	5%	63V
C124	1-123-875-11	Elect.	10μF	20%	50V
C125, C127	1-126-233-11	Elect.	22μF	20%	25V
C126, C128	1-162-851-11	Ceramic	0.1μF	20%	16V
C129, C130	1-124-499-11	Elect.	1μF	20%	50V
C131	1-161-377-00	Ceramic	0.0047μF	30%	16V
C132	1-124-927-11	Elect.	4.7μF	20%	50V
C133	1-124-499-11	Elect.	1μF	20%	50V
C134	1-124-477-11	Elect.	47μF	20%	16V
C135	1-162-294-31	Ceramic	0.001μF	10%	50V
C136	1-162-282-31	Ceramic	100pF	10%	50V
C137	1-162-851-11	Ceramic	0.1μF	20%	16V
C138, C139	1-126-101-11	Elect.	100μF	20%	16V
C140	1-124-902-00	Elect.	0.47μF	20%	50V
C141	1-130-489-00	Mylar	0.033μF	5%	50V
C142	1-124-902-00	Elect.	0.47μF	20%	50V
C143, C144	1-126-233-11	Elect.	22μF	20%	25V

CIRCUIT NO.	PART NO.	DESCRIPTION			
C145	1-130-772-00	Film	0.22μF	5%	63V
C146	1-130-483-00	Mylar	0.01μF	5%	50V
C147, C148	1-162-199-31	Ceramic	10pF	5%	50V
C149	1-161-379-00	Ceramic	0.01μF	20%	16V
C151	1-162-202-31	Ceramic	13pF	5%	50V
C152	1-162-203-31	Ceramic	15pF	5%	50V
C154-C158	1-124-443-00	Elect.	100μF	20%	10V
C161	1-161-379-00	Ceramic	0.01μF	20%	16V
C162	1-162-294-31	Ceramic	0.001μF	10%	50V
C163	1-130-489-00	Mylar	0.033μF	5%	50V
C164, C165	1-124-499-11	Elect.	1μF	20%	50V
C170	1-126-233-11	Elect.	22μF	20%	25V
C171	1-162-211-31	Ceramic	33pF	5%	50V
C172	1-130-489-00	Mylar	0.033μF	5%	50V
C173	1-106-347-00	Mylar	0.0015μF	5%	50V
C174, C180	1-126-233-11	Elect.	22μF	20%	25V
C181	1-162-211-31	Ceramic	33pF	5%	50V
C182	1-130-489-00	Mylar	0.033μF	5%	50V
C183	1-106-347-00	Mylar	0.0015μF	5%	50V
C184	1-126-233-11	Elect.	22μF	20%	25V
C251	1-136-157-00	Film	0.022μF	5%	50V
C502	1-124-443-00	Elect.	100μF	20%	10V
C503, C504	1-162-290-31	Ceramic	470pF	10%	50V
C601, C602	1-124-638-11	Elect.	22μF	20%	6.3V
C603	1-124-438-00	Elect.	1μF	20%	50V
C604	1-162-851-11	Ceramic	0.1μF	20%	16V
C605	1-162-290-31	Ceramic	470pF	10%	50V
	Resistors				
R001	1-249-429-11	Carbon	10k	5%	1/4W
R002, R003	1-249-425-11	Carbon	4.7k	5%	1/4W
R004	1-249-423-11	Carbon	3.3k	5%	1/4W
R005	1-249-431-11	Carbon	15k	5%	1/4W
R006	1-247-874-11	Carbon	62k	5%	1/4W
R007	1-249-417-11	Carbon	1k	5%	1/4W
R008	1-249-423-11	Carbon	3.3k	5%	1/4W
R010	1-249-381-11	Carbon	1ohm	5%	1/4W
R101	1-249-428-11	Carbon	8.2k	5%	1/4W
R102	1-247-860-11	Carbon	16k	5%	1/4W
R103	1-249-421-11	Carbon	2.2k	5%	1/4W
R104	1-215-381-00	Metal	22ohm	1%	1/6W
R105	1-247-806-11	Carbon	91ohm	5%	1/4W
R106	1-249-433-11	Carbon	22k	5%	1/4W
R107, R112	1-249-417-11	Carbon	1k	5%	1/4W
R108, R109	1-249-432-11	Carbon	18k	5%	1/4W
R110, R111	1-249-425-11	Carbon	4.7k	5%	1/4W
R113, R115	1-247-882-11	Carbon	130k	5%	1/4W
R114, R116	1-247-881-00	Carbon	120k	5%	1/4W
R117	1-249-381-11	Carbon	1ohm	5%	1/4W
R118, R120	1-249-393-11	Carbon	10ohm	5%	1/4W
R119	1-247-882-11	Carbon	130k	5%	1/4W
R122	1-249-440-11	Carbon	82k	5%	1/4W
R123	1-247-889-00	Carbon	270k	5%	1/4W
R124	1-249-435-11	Carbon	33k	5%	1/4W
R125, R128	1-249-393-11	Carbon	10ohm	5%	1/4W
R126	1-249-423-11	Carbon	3.3k	5%	1/4W
R127	1-249-425-11	Carbon	4.7k	5%	1/4W
R129	1-249-429-11	Carbon	10k	5%	1/4W
R130	1-247-896-11	Carbon	510k	5%	1/4W
R131	1-249-433-11	Carbon	22k	5%	1/4W
R132	1-249-414-11	Carbon	560ohm	5%	1/4W
R133	1-249-441-11	Carbon	100k	5%	1/4W
R134	1-215-434-00	Metal	3.6k	1%	1/6W
R135	1-249-441-11	Carbon	100k	5%	1/4W
R136	1-249-437-11	Carbon	47k	5%	1/4W
R137	1-249-435-11	Carbon	33k	5%	1/4W
R138	1-249-393-11	Carbon	10ohm	5%	1/4W
R139	1-249-381-11	Carbon	1ohm	5%	1/4W
R140	1-249-429-11	Carbon	10k	5%	1/4W
R141	1-247-903-00	Carbon	1M	5%	1/4W
R142	1-249-433-11	Carbon	22k	5%	1/4W
R143, R144	1-249-441-11	Carbon	100k	5%	1/4W
R145, R150	1-249-429-11	Carbon	10k	5%	1/4W
R146, R147	1-215-469-00	Metal	100k	1%	1/6W
R151-R154	1-249-417-11	Carbon	1k	5%	1/4W
R155	1-249-411-11	Carbon	330ohm	5%	1/4W
R156-R160	1-249-417-11	Carbon	1k	5%	1/4W
R161, R162	1-249-441-11	Carbon	100k	5%	1/4W
R163	1-249-438-11	Carbon	56k	5%	1/4W
R164	1-249-424-11	Carbon	3.9k	5%	1/4W
R165, R170	1-249-429-11	Carbon	10k	5%	1/4W
R166-R168	1-249-417-11	Carbon	1k	5%	1/4W
R171	1-249-439-11	Carbon	68k	5%	1/4W
R172	1-249-440-11	Carbon	82k	5%	1/4W
R173	1-247-832-11	Carbon	1.1k	5%	1/4W
R174	1-249-413-11	Carbon	470ohm	5%	1/4W
R175, R176	1-249-425-11	Carbon	4.7k	5%	1/4W
R177	1-249-417-11	Carbon	1k	5%	1/4W
R178	1-247-903-00	Carbon	1M	5%	1/4W
R179	1-247-883-00	Carbon	150k	5%	1/4W
R180	1-249-429-11	Carbon	10k	5%	1/4W
R181	1-249-439-11	Carbon	68k	5%	1/4W
R182	1-249-440-11	Carbon	82k	5%	1/4W
R183	1-247-832-11	Carbon	1.1k	5%	1/4W
R184	1-249-413-11	Carbon	470ohm	5%	1/4W
R185, R186	1-249-425-11	Carbon	4.7k	5%	1/4W
R187	1-249-417-11	Carbon	1k	5%	1/4W
R188	1-247-903-00	Carbon	1M	5%	1/4W
R189	1-247-883-00	Carbon	150k	5%	1/4W
R190, R191	1-249-405-11	Carbon	100ohm	5%	1/4W
R192, R193	1-249-433-11	Carbon	22k	5%	1/4W
R195	1-249-429-11	Carbon	10k	5%	1/4W
R197, 501, 502	1-249-417-11	Carbon	1k	5%	1/4W
R503, R504	1-249-429-11	Carbon	10k	5%	1/4W
R505, R506	1-249-424-11	Carbon	3.9k	5%	1/4W
R507, R508	1-249-405-11	Carbon	100ohm	5%	1/4W
R601-R603	1-249-435-11	Carbon	33k	5%	1/4W
R608-R611	1-249-425-11	Carbon	4.7k	5%	1/4W
R612	1-249-421-11	Carbon	2.2k	5%	1/4W
R613-R615	1-249-437-11	Carbon	47k	5%	1/4W
R619-R620	1-249-429-11	Carbon	10k	5%	1/4W
R621	1-249-437-11	Carbon	47k	5%	1/4W
R622	1-247-887-00	Carbon	220k	5%	1/4W
R623	1-249-413-11	Carbon	470ohm	5%	1/4W

ACCESSARY & PACKING MATERIAL

PART NO.	DESCRIPTION
4-922-466-01	Cushion (Pad)
4-922-465-11	Individual carton 〈Black model〉
4-922-465-21	Individual carton 〈Silver model〉
3-786-841-41	Manual, instruction
1-558-543-11	Cord, connection
1-574-408-11	Cord, connection (RI)
3-701-630-01	Polyetylene bag
4-922-467-01	Serial sheet
4-922-470-01	Polyetylene bag for warranty card
4-922-469-01	Warranty card
3-704-346-01	Sheet, protection

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